

Magnetic Phase transition of Mn dimer on graphene doped h-BN through external electric field

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Abstract: Using density functional theory we first show that the interaction between two Mn atoms can be tuned from anti-ferromagnetic (AFM) to ferromagnetic (FM) state by creating charge disproportion between the two atoms by customizing the ligands [1]. Then we show that an external electric field can be used to control the charge disproportion between two Mn atoms. For this we embedded the Mn dimer on a carbon-doped hexagonal boron nitride (h-BN) sheet and show that an electric field perpendicular to the h-BN surface switches the system from an AFM state to a FM state [2]. Using these two magnetic states (FM and AFM) one can store one-bit (0 or 1) information per chip.

References:

1. K. Pradhan and P. Jena, Chem. Phys. Lett., 2012, 97, 525-26.
2. M. Sahoo and K. Pradhan (to be submitted)